



King's Research Portal

DOI:

[10.1016/j.psychres.2016.11.036](https://doi.org/10.1016/j.psychres.2016.11.036)

Document Version

Peer reviewed version

[Link to publication record in King's Research Portal](#)

Citation for published version (APA):

Bucci, S., Emsley, R., & Berry, K. (2017). Attachment in psychosis: A latent profile analysis of attachment styles and association with symptoms in a large psychosis cohort. *Psychiatry Research*, 247, 243-249. <https://doi.org/10.1016/j.psychres.2016.11.036>

Citing this paper

Please note that where the full-text provided on King's Research Portal is the Author Accepted Manuscript or Post-Print version this may differ from the final Published version. If citing, it is advised that you check and use the publisher's definitive version for pagination, volume/issue, and date of publication details. And where the final published version is provided on the Research Portal, if citing you are again advised to check the publisher's website for any subsequent corrections.

General rights

Copyright and moral rights for the publications made accessible in the Research Portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognize and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the Research Portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the Research Portal

Take down policy

If you believe that this document breaches copyright please contact librarypure@kcl.ac.uk providing details, and we will remove access to the work immediately and investigate your claim.

1. Introduction

The attachment system involves a complex interaction between genetic, biological, developmental and environmental factors. Twin studies in infants/toddlers have found evidence of strong environmental influences on attachment, but some research on adolescent attachment patterns show a substantial genetic influence, with attachment styles influenced by heritable traits such that attachment security emerges through the two-way interplay between the child's genes and the caregiving environment (Fearon, Shmueli-Goetz, Viding, Fonagy & Plomin, 2014). Furthermore, longitudinal evidence supports the idea of genetic contributions to continuity and change in attachment security from infancy to young adulthood, suggesting that attachment styles are not necessarily stable across the lifespan, even in healthy individuals (Raby, Cicchetti, Carlson, Egeland & Collins (2013).

Despite this complex interplay, it is now well established that adverse developmental experiences are associated with increased vulnerability to developing psychosis (Varese et al., 2012). Attachment theory (Bowlby, 1969) has been used to understand individuals' approaches to seeking help during periods of distress and their adaptation to childhood adversities (Read et al., 2005). Three organised patterns of adult attachment have been described: secure, insecure-anxious and insecure-avoidant (Hesse, 2008) and have been widely conceptualised in accordance with a two-dimensional model of attachment anxiety and attachment avoidance, with high levels on either dimension representing an insecure attachment pattern/style. Attachment anxiety involves expectations of separation and rejection and is characterised by a negative self-perception, dependence on others and exaggerated affect or helplessness

to maintain contact or proximity with another (Purnell, 2010). Attachment avoidance is associated with emotional deactivation, autonomy, avoidance of close relationships and negative perceptions of others (Bartholomew and Horowitz, 1991). Individuals who report low levels on both dimensions represent a secure attachment pattern/style, which is associated with a positive self-image, an ability to form emotionally close relationships and regulate emotional distress, and autonomy. Insecure attachment is associated with worse outcomes in terms of symptom severity and course of illness (Gumley et al., 2014; Korver-Nieberg et al., 2013), poorer engagement with services, more interpersonal problems, more severe trauma, greater positive and negative psychotic symptoms and greater affective symptoms (Gumley et al., 2014). Research has found an over-representation of insecure-avoidant attachment in clients with psychosis (Berry et al., 2007; Gumley et al., 2014). Whilst insecure anxious and avoidant attachment patterns represent coherent attempts to adapt to an adverse caregiving environment, some individuals demonstrate a fearful attachment pattern, which is associated with high levels of both anxiety and avoidance (Bartholomew and Horowitz, 1991) and disorganisation of the attachment system (Main and Hesse, 1990). Disorganised attachment is thought to develop in the context of insensitive parental behaviour such that the individual lacks coherence in regulating affect and getting his/her attachment needs met (Hesse and Main, 2006); the caregiver, who is a potential source of comfort, is in fact a source of threat. Not only is disorganised attachment a potential risk factor in the development of psychosis (Harder, 2014; Liotti and Gumley, 2009; Longden et al., 2012), it is also associated with childhood adversity and dissociative symptoms (Liotti and Gumley, 2009; Longden et al., 2012), increased risk of trauma history and increased psychopathology (Harder, 2014). Researchers using self-reported attachment have made conceptual links between

disorganised attachment and high scores on the two attachment dimensions; however, specific correlates of disorganised attachment in psychosis are yet to be determined (Harder, 2014).

In this study, we combined observations on the Psychosis Attachment Measure (PAM; Berry et al., 2006), the most widely used measure of attachment in psychosis, from seven samples with established psychosis, collected in the UK between 2004 and 2012. Our aims are twofold: (i) to explore patterns of response across attachment (PAM) items using latent profile analysis to confirm four proposed attachment patterns; and (ii) to examine associations between these latent classes and their clinical and demographic correlates. We hypothesise that the PAM can be used to categorise clients with psychosis into four different attachment groups (secure, insecure-avoidant, insecure-anxious, disorganised). We further hypothesise that disorganised attachment will be associated with more frequent reports of trauma history and more positive psychotic symptoms.

2. Method

2.1 Subjects and Study Setting

The sample consisted of 588 people who met Diagnostic and Statistical Manual (Fourth Edition; DSM-IV) diagnosis of schizophrenia-related disorder who participated in psychosis-related studies across the UK. The research team obtained these diagnoses from the referring clinician and the client's clinical records. Seven sets of archived data sets were used to create a large cohort of participants who met the eligibility criteria of the current study (Arbuckle et al., 2012; Barrowclough et al., 2010; Berry et al., 2008; Berry et al., 2014; Blackburn et al., 2010; Picken et al.,

2010; Pilton et al., in submission). Written informed consent for participation in each study and for related studies was obtained from all participants and the relevant local research ethics committee approved each study. Clinicians from inpatient and community mental health services in the North West of England identified and invited eligible clients to take part in each relevant study. The researchers then reviewed the participants' medical notes for demographic and background information. Inclusion criteria for this analysis were: 1) meets criteria for any non-affective psychotic disorder as confirmed by treating psychiatrist and case note review; 2) aged 16 years/above; 3) in contact with mental health services; 4) no significant history of organic factors implicated in the aetiology of psychotic symptoms (confirmed by treating psychiatrist and case note review); 5) completed the PAM; and 6) English speaking.

2.2 Measures

Attachment. The PAM (Berry et al., 2008) is a 16-item self-report questionnaire assessing two dimensions of anxious and avoidant attachment. Participants' rate on a four-point Likert scale the extent to which each statement describes how they currently relate to key people in their life ('not at all' to 'very much'). Total scores are calculated for each dimension by averaging item scores, with higher scores reflecting greater anxiety and avoidance. Acceptable levels of internal consistency have been demonstrated across studies, with Cronbach's alpha coefficients ranging from 0.70 to 0.86 for the anxiety dimension, and from 0.60 to 0.91 for the avoidance dimension (Gumley et al., 2014).

Psychotic Symptoms. The PSYRATS (G. et al., 1999) is a semi-structured interview designed to assess the subjective characteristics of hallucinations and delusions and comprises two scales: auditory hallucinations (11 items) and delusions (6 items). In keeping with how the PSYRATS is designed to be used, this measure was only administered to those participants who exhibited delusions and hallucinations. The scales have been used widely and have good psychometric properties with individuals with established psychosis (Drake, 2007). The PSYRATS was administered by interviewers trained and supervised by expert clinical academics in the administration and scoring of the measure.

Trauma. Trauma was assessed either using the Trauma History Questionnaire (THQ; Green, 1995), which is a semi-structured interview used to assess history of exposure to several types of trauma, or the Childhood Trauma Questionnaire (CTQ; D.P. et al., 1994), which is a self-report measure that evaluates childhood emotional, physical and sexual abuse and childhood physical and emotional neglect. Scores were collapsed to form a binary Yes/No variable indicating whether or not clients reported a traumatic event (Kilcommons and Morrison, 2005). Traumatic events were grouped according to whether subjects reported either physical or sexual abuse. We examined only physical and sexual abuse in the current study as interpersonal traumas, in particular physical and sexual abuse, have been specifically linked to psychotic symptoms (Varese et al., 2012) and have been shown to increase vulnerability to the development of psychotic symptoms via disruptions in the attachment system (Longden et al., 2012). Four studies collected trauma data (Barrowclough et al., 2010; Berry et al., 2008; Blackburn et al., 2010; Pilton et al., in submission). The THQ was

administered by interviewers trained and supervised by expert clinical academics in the administration and scoring of the measure.

Demographic Characteristics. Participants' age, number of psychiatric hospital admissions, gender, ethnicity and diagnosis were assessed using a demographic inventory administered with the interview.

2.3 Statistical Analysis

The sample is described using summary statistics. Latent profile analysis was used to determine the number and nature of attachment classes in psychosis based on responses to the 16-item PAM measure, treating the PAM scale (0-3) as continuous. Latent profile analysis (Vermunt and Parkinson, 2002) is an individual-centred form of finite mixture model of the number of discrete latent classes of individuals identified on a set of continuous indicators (i.e. the PAM items). The statistical method is concerned with the structure of cases (not items) and is used to identify homogenous groups (classes) from categorical multivariate data (Muthén and Muthén, 2000). Following maximum likelihood estimation, the fit of five different models (two-class to model through to six-class model) was assessed. We specifically aimed to examine the number, size and symptoms profiles of risk classes. Selection of the optimum number of latent classes was determined based on several posterior fit statistics: Akaike information criterion (AIC), Bayesian information criterion (BIC), sample-size adjusted BIC (ssABIC), the Vuong-Lo-Mendell-Rubin likelihood ratio test (VLRRT), bootstrap likelihood ratio test (BLRT) and entropy measures. The information statistics AIC, BIC and ssABIC are goodness-of-fit measures used to compare competing models; lower observed values indicate better fit (Lin and

Dayton, 1997). The VLRT and BLRT compare the fit of nested latent class models and are used to compare models with increasing numbers of latent classes; a non-significant value ($p > 0.05$) suggests that the model with one class fewer should be accepted. Entropy is a standardised measure of how accurately participants are classified. Entropy values can range from 0 (no predictive power) to 1 (perfect prediction). A subjective assessment of whether additional classes were qualitatively different or variations on existing classes was also applied.

Based on posterior probabilities, an individual's most likely class membership was assigned. We assessed the association with baseline characteristics in order to examine which variables differed significantly between class membership (Pickles & Croudace, 2010). We compare the means and standard deviations, or numbers, of baseline variables with the nominal latent class variable using t-tests or chi-square tests as appropriate. In the latent profile analysis, we allow for dataset source as a clustering variable to account for differences in the casemix of the individuals completing the PAM measure (except for bootstrap LRT, where the clustering adjustment is not possible). Mplus 7.11 was used to perform the analysis (Muthén and Muthén, 2000).

3. Results

3.1 Descriptive data

The baseline characteristics for the sample are shown in Table 1. The mean age of the sample was 36.71 years, 80.4% were male, the mean number of psychiatric hospital admissions was 3.91, and the majority of the sample was White British (88.9%). Of the 285 participants who completed trauma data, 20.7% of participants reported ever

being sexually abused and nearly a half (45.8%) reported ever being physically abused.

Insert Table 1 about here

3.2 Latent Class Model Selection

Table 2 shows the fit indices from the latent class analysis.

Insert Table 2 about here

We consider the four-class solution to be the best model, though there was a lack of consistency in the model fit statistics. The AIC and BIC values for the four-class solution are higher than that for the five- and six-class solutions but: i) the patterns of trajectories appears qualitatively similar; ii) the five- and six-class solutions did not result in convergence to any meaningful underlying theoretical model; and iii) in the five- and six- class solutions, the number of individuals in the additional classes is relatively low. As such, we pursued the most parsimonious and theoretically meaningful model. The entropy of the four-class model (0.821) indicates a good classification of clients into classes.

Insert Figure 1 about here

3.3 Four-class Solution Characteristics

Table 3 presents the item content and the mean item scores in each of the four latent classes, and the number of subjects in each class. Figure 1 shows the latent class profile plot for the four classes. Overall, a relatively clear pattern emerged. Class 1 was the largest class with 219 participants (37% of the sample) and was characterised by the lowest mean score on almost all the PAM items. This class was considered the

secure attachment group. Class 2 comprised 120 participants (20%) and was characterised by high mean scores on the items relating to insecure-avoidant attachment and low mean scores on the insecure-anxious items. This class was considered the insecure-avoidant attachment group. Class 3 comprised 166 participants (28%) and was characterised by high mean scores on the items relating to insecure-anxious attachment and low mean scores on the insecure-avoidant items. This class was considered the insecure-anxious attachment group. Class 4, the smallest class, comprised 83 participants (14%), was characterised by high mean scores on all items and was labeled the disorganised attachment group.

3.4 Associations between latent classes and demographic factors, symptom variables and trauma

Table 4 shows the results of the association between the four latent classes and demographic and clinical factors. Participants assigned to disorganised attachment were significantly older (40.64 years, SD=12.41) than participants in the other three classes. Post-hoc tests showed that participants assigned to the insecure-anxious and disorganised attachment classes were significantly older than those assigned to the insecure-avoidant class. There was no significant difference across classes in number of hospital admissions. For all classes, the proportion of gender and ethnicities did not differ.

There was a significant difference between classes ($p < 0.05$) for both mean delusion and hallucination scores. Participants assigned to insecure-avoidant (13.46, SD=5.03) and disorganised attachment (13.96, SD=4.35) reported significantly higher mean delusions scores than clients in the secure (11.16, SD=5.73) attachment class. For hallucinations, participants assigned to disorganised attachment (28.02, SD=7.25)

reported significantly higher mean scores compared with the secure (21.07, SD=11.62) and insecure-anxious (22.58, SD=10.85) attachment classes. Across classes, participants reported higher rates of physical abuse than sexual abuse, with higher rates of both physical (74%) and sexual (39%) abuse in the disorganised attachment class, compared to all other classes (physical, chi-square=23.52, $p<0.001$; sexual, chi-square=16.05, $p=0.001$).

4. Discussion

The primary aim of this study was to identify patterns of attachment using the PAM, the most widely used self-report measure of attachment in psychosis, and to examine the demographic and clinical correlates associated with different attachment patterns. A four class solution was considered the best model and thus support underlying theoretical models of attachment classification as suggested by Bartholomew (Bartholomew and Horowitz, 1991) and Hesse (Hesse, 2008). Class 1, secure attachment, was characterised by the lowest mean scores on almost all PAM items. Participants were overall less symptomatic than those assigned to other classes, with lower delusions scores relative to the insecure-avoidant and disorganised attachment classes, lower hallucinations scores relative to the insecure-anxious and disorganised attachment classes, and the lowest reported rates of physical and sexual abuse. Class 2, insecure-avoidant attachment, was characterised by high mean scores on PAM insecure-avoidant items and low mean scores on PAM insecure-anxious items. Class 3, insecure-anxious attachment, was characterised by high mean PAM insecure-anxious items and low mean insecure-avoidant items. Class 4, disorganised attachment, was the smallest class characterised by high mean scores on both anxious and avoidant PAM items, suggesting that individuals have a contradictory rather than

consistent approach of relating to significant others. For example, such individuals may feel upset, anxious or angry if other people are not available when needed and worry about others not accepting them, but also find it difficult to accept help from others when needed and instead cope with problems themselves. We would argue that this conceptualisation helpfully extends the unresolved classification on the Adult Attachment Interview (AAI; Hesse, 2008), which is more traditionally characterised by lapses in the monitoring of reasoning or discourse when describing experiences of loss or trauma. Furthermore, participants assigned to the disorganised class demonstrated the most clinical impairment and reported the highest rates of abuse: they had significantly higher hallucinations scores compared to the secure and insecure-anxious groups, and higher delusions scores, but only significantly so when compared with secure attachment. Disorganised attachment was also significantly more common if both physical and sexual abuse were present.

Although lower than proportions reported in healthy populations (around 60%; Mickelson et al., 1997), we found that secure attachment was the most common attachment style in the sample, followed by insecure-anxious, insecure-avoidant and disorganised attachment. The relatively high predominance of secure attachment is a key finding, suggesting that a significant number of clients with psychosis are inherently resilient. Previous attachment and psychosis studies using the AAI have found an over-representation of insecure-avoidant attachment styles in psychosis ranging from 48% to 71% (Harder, 2014). Whilst the avoidant group in our study was the third largest class (20%), the relatively low proportion of clients in this group compared to other studies using the AAI may suggest that self-report measures are potentially less sensitive measures of avoidant attachment in psychosis; however, this discrepancy may also relate to the way in which the AAI is scored: unresolved

participants are forced into one of the three main categories. In this respect, it is possible for people to be both avoidant and unresolved/disorganised, whereas in our study, avoidant and disorganised attachment were mutually exclusive. Only two relatively small studies have reported patterns of unresolved attachment, which ranged from 29.4% (MacBeth et al., 2011) to 35% (Gumley et al., 2014). Again, this is slightly lower than the 14% of participants identified in this study. This discrepancy may also be associated with the use of the AAI versus the PAM, or the different groups sampled (first episode psychosis versus established psychosis in the current study), as it is possible that people's attachment patterns become less disorganised as they age or adapt to psychosis.

The finding that participants assigned to the disorganised group were older may be confounded with experience of trauma and symptom severity, as these participants were more likely to comprise individuals with higher rates of physical and sexual abuse, which previous research has shown is associated with worse outcomes and more protracted recovery (Gumley et al., 2014; Korver-Nieberg et al., 2013).

Rates of childhood trauma (physical and sexual abuse) in this sample were comparable with rates reported in other similar studies (Read et al., 2005). Regarding psychotic symptoms, higher delusions scores were apparent in the insecure-avoidant and disorganised attachment groups, reflecting previous studies demonstrating robust associations between paranoia and endorsement of delusional-like experiences and dismissing (avoidant) attachment (Harder, 2014; Varghese et al., 2008). Perhaps the most interesting findings are that participants with disorganised attachment had higher hallucinations scores and higher rates of physical and sexual abuse, which indirectly points to a potential association between disorganised attachment and positive

psychotic symptoms. Furthermore, disorganised attachment has been closely linked to trauma, a finding that is reflected in the current study, as well as other adverse experiences in childhood, such as disrupted caregiver behavior (Harder, 2014). There are multiple pathways to the development of disorganised attachment, including caregiver maltreatment (e.g. physical, sexual or emotional abuse) and/or more subtle but frequent insensitive parenting behaviours (Lyons-Ruth and Jacobvitz, 1999). These subtle behaviours are more likely to occur in the context of an accumulation of socioeconomic risk factors, parental loss or trauma (Hesse and Main, 2006) and parental hostile/helpless states of mind. However, considerable variance in disorganised attachment remained unexplained in the current study, indicating the need for research to examine the interplay between infant factors, anomalous parenting and the wider social context in determining the development of disorganised attachment. Furthermore, the finding that disorganised attachment (i.e. increased relational difficulties across the board) was associated with hallucinations may be related to the severity of psychosis. Similarly, early adversity may be associated with more severe psychosis giving rise to difficulties that can be conceptualised as disorganised attachment.

We appreciate that the model-fit statistics suggest that a five or six class solution might be statistically viable, as the number of classes increased the number of participants in each class became relatively low, making it difficult to distinguish participants into theoretically meaningful attachment groups. Furthermore, the additional groups in the five- or six- class solution were not qualitatively different in their response patterns to the existing four classes. We used the four-class solution in the subsequent associational analysis as it allowed for the most theoretically meaningful and parsimonious model of attachment, and the results of these gave

further face validity to the identified classes. However, we acknowledge that an element of subjectivity was used in determining the best solution and the model fit statistics suggest there is little to choose between the three, four and five class solutions. For example, the three class solution looks akin to a classic secure / avoidant / anxious-ambivalent solution. Similarly, the five class solution may be viewed as similar to the Hesse / Main AAI five classification (including cannot classify).

Clinically, allocating participants into a specific attachment class is somewhat artificial as participants can display characteristics associated with various classes. Furthermore, we cannot exclude the possibility that there may have been differences between the study samples that could affect attachment class allocation; although, we did control for study source in the analysis. We investigated associations between attachment and delusions and hallucinations specifically. However, we acknowledge that the scope of external correlates examined to validate the PAM-based subgroups is limited; the ability to predict attachment patterns is likely multifaceted. For example, variables including emotional abuse, neglect, parental loss, bullying, other disrupted caregiving behaviors and, importantly, dissociation in the context of disorganised attachment (Read & Gumley, 2008), may be associated with different types of attachment. Furthermore, traumatic events were grouped according to whether participants reported either physical or sexual abuse. Whilst this made sense in the context of the current study to increase power, it comes at a cost of losing specificity around the trauma typologies and increases the risk of conflating exclusively childhood trauma with adult trauma, and/or childhood/adult trauma. In addition, diagnostic groupings were combined and are contained within the broad category of psychosis, which in some respects, may create problems for internal and external

validity. However given the well-documented problem with the lack of reliability and validity of psychiatric diagnoses (e.g. Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Bentall, 2004), the issue of sample heterogeneity is of limited importance in this study and is not the primary outcome of interest in the current study. Finally, these data were cross-sectional and therefore inferences regards causality and direction of effects cannot be made. Findings should be extended to a prospective study.

A validated self-report measure of attachment in psychosis can be used to identify more frequent reports of more severe symptomatology and trauma history. Clinicians should be mindful of enquiring about trauma history in clients with psychosis and assessing attachment status when gathering clinical history information for possible problematic relational patterns. Experienced clinicians should support staff in relational factors encountered when working with people with psychosis with more severe symptomatology and disrupted attachment styles and trauma history. Also, psychological therapies targeting trauma that also address attachment-related experiences should be considered when developing intervention plans based on idiosyncratic formulations. There is a growing call to examine the psychological mechanisms underpinning the development and maintenance of psychotic symptoms and applying this examination to the development of interventions. Future studies should examine the clinical correlates of the four attachment styles with specific symptoms of psychosis. Developing a strong set of clinical and demographic predictors that can identify the characteristics of clients prospectively that belong in each attachment class would be valuable. The generalisability of our findings is limited by the fact that the majority of our sample was male. Therefore, further consideration regarding the distribution of attachment styles and associated

characteristics in females and across cultures is needed. Finally, the disproportionately high percentage of self-reported secure attachment challenges previous smaller studies of attachment in psychosis that report higher rates of insecure attachment. Further research exploring secure attachment in the context of psychosis is needed given the important association we found between being less symptomatic and being classified as having a secure attachment; although, the direction of causality regards this relationship remains unclear at this stage. Further investigation identifying factors that are potentially protective of psychotic-related experiences is needed.

Acknowledgements

The authors would like to thank the service users who participated in these studies and the researchers who contributed to the datasets included in this study. The MIDAS trial was sponsored by the University of Manchester and funded by the UK Medical Research Council (grant no: GO200471) and the Department of Health, with additional support from the Mental Health Research Network UK and was conducted in collaboration with staff and service users from participating NHS trusts (Trial registration: Current Controlled Trials ISRCTN14404480). The ReCAP trial was commissioned by the UK's National Institute for Health Research (NIHR) under its Programme Grants for Applied Research scheme (RP-PG-0606-1302) and was conducted in collaboration with staff and service users from participating NHS trusts (Trial registration: Current Controlled Trials no. ISRCTN88275061).

References

- Arbuckle, R., Berry, K., Taylor, J.-L., Kennedy, S., 2012. Service user attachments to psychiatric key workers and teams. *Social psychiatry and psychiatric epidemiology* 47 (5), 817-825.
- Barrowclough, C., Haddock, G., Wykes, T., Beardmore, R., Conrod, P., Craig, T., Davies, L., Dunn, G., Eisner, E., Lewis, S., 2010. Integrated motivational interviewing and cognitive behavioural therapy for people with psychosis and comorbid substance misuse: randomised controlled trial. *BMJ* 341, c6325.
- Bartholomew, K., Horowitz, L.M., 1991. Attachment styles among young adults: a test of a four-category model. *Journal of Personality and Social Psychology* 61 (2), 226.
- Berry, K., Barrowclough, C., Wearden, A., 2007. A review of the role of adult attachment style in psychosis: unexplored issues and questions for further research. *Clinical psychology review* 27 (4), 458.
- Berry, K., Barrowclough, C., Wearden, A., 2008. Attachment theory: A framework for understanding symptoms and interpersonal relationships in psychosis. *Behaviour research and therapy* 46 (12), 1275-1282.
- Berry, K., Roberts, N., Danquah, A., Davies, L., 2014. An exploratory study of associations between adult attachment, health service utilisation and health service costs. *Psychosis: Psychological, Social and Integrative Approaches* 6 (4), 355-358.
- Berry, K., Wearden, A., Barrowclough, C., Liversidge, T., 2006. Attachment styles, interpersonal relationships and psychotic phenomena in a non-clinical student sample. *Personality and Individual Differences* 41 (4), 707-718.
- Blackburn, C., Berry, K., Cohen, K., 2010. Factors correlated with client attachment to mental health services. *The Journal of nervous and mental disease* 198 (8), 572-575.
- Bowlby, J., 1969. Attachment. *Attachment and Loss* Vol. I. Hogarth, London.
- D.P., B., L., F., L., H., J., F., M., L., K., W., E., S., J., R., 1994. Initial reliability and validity of a new retrospective measure of child abuse and neglect. *Am J Psychiatry* 151 (8), 1132-1136.
- Drake, R., Haddock, G., Tarrier, N., Bentall, R. & Lewis, S., 2007. Psychotic Symptom Rating Scales (PSYRATS): Their usefulness and properties in first episode psychosis. *Schizophrenia Research* 89, 119-122.
- Fearon, P., Shmueli-Goetz, Y., Viding, E., Fonagy, P. and Plomin, R., 2014. Genetic and environmental influences on adolescent attachment. *Journal of Child Psychology and Psychiatry*, 55(9), pp.1033-1041.
- Haddock, G., 1999. Scales to measure dimensions of hallucinations and delusions: the psychotic symptom rating scales (PSYRATS). *Psychological medicine* 29 (4), 879-889.
- Green, B., 1995. Trauma History Questionnaire, in: Stamm, B.H., Barra, E.M. (Eds.), *Measurement of stress, trauma, and adaptation*, Lutherville.

- Gumley, A., Taylor, H., Schwannauer, M., MacBeth, A., 2014. A systematic review of attachment and psychosis: measurement, construct validity and outcomes. *Acta Psychiatrica Scandinavica* 129 (4), 257-274.
- Harder, S., 2014. Attachment in Schizophrenia—Implications for research, prevention, and Treatment. *Schizophrenia bulletin* 40 (6), 1189-1193.
- Hesse, E., 2008. The Adult Attachment Interview: Protocol, method of analysis, and empirical studies, in: Cassidy, J., Shaver, P.R. (Eds.), *Handbook of attachment: Theory, research, and clinical applications*, 2nd ed. Guilford Press, New York, pp. 552-598.
- Hesse, E., Main, M., 2006. Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and psychopathology* 18 (02), 309-343.
- Kilcommons, A.M., Morrison, A., 2005. Relationships between trauma and psychosis: an exploration of cognitive and dissociative factors. *Acta Psychiatrica Scandinavica* 112 (5), 351-359.
- Korver-Nieberg, N., Fett, A.-K.J., Meijer, C.J., Koeter, M.W., Shergill, S.S., de Haan, L., Krabbendam, L., 2013. Theory of mind, insecure attachment and paranoia in adolescents with early psychosis and healthy controls. *Australian and New Zealand Journal of Psychiatry* 47 (8), 737-745.
- Lin, T.H., Dayton, C.M., 1997. Model selection information criteria for non-nested latent class models. *Journal of Educational and Behavioral Statistics* 22 (3), 249-264.
- Liotti, G., Gumley, A.I., 2009. An attachment perspective on schizophrenia: Disorganized attachment, dissociative processes, and compromised mentalisation, in: Moskowitz, A., Dorahy, M., Schaefer, I. (Eds.), *Dissociation and Psychosis: Converging Perspectives on a Complex Relationship*. John Wiley & sons Ltd, pp. 117-133.
- Longden, E., Madill, A., Waterman, M.G., 2012. Dissociation, trauma, and the role of lived experience: toward a new conceptualization of voice hearing. *Psychological bulletin* 138 (1), 28-76.
- Lyons-Ruth, K., Jacobvitz, D., 1999. Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies, in: Cassidy, J., Shaver, P.R. (Eds.), *Handbook of attachment: Theory, research, and clinical applications*. Guilford Press, New York.
- MacBeth, A., Gumley, A., Schwannauer, M., Fisher, R., 2011. Attachment states of mind, mentalization, and their correlates in a first- episode psychosis sample. *Psychology and Psychotherapy: Theory, Research and Practice* 84 (1), 42-57.
- Main, M., Hesse, E., 1990. Parents' unresolved traumatic experiences are related to infant disorganized attachment status: Is frightened and/or frightening parental behavior the linking mechanism?, in: Greenberg, M.T., Cicchetti, D., Cummings, E.M. (Eds.), *Attachment in the preschool years: Theory, research, and intervention*. The John D. and Catherine T. MacArthur Foundation series on mental health and development. University of Chicago Press, Chicago, IL, pp. 161-182.
- Mickelson, K.D., Kessler, R.C., Shaver, P.R., 1997. Adult attachment in a nationally representative sample. *Journal of Personality and Social Psychology* 73 (5), 1092-1106.
- Muthén, B.O., Muthén, L.K., 2000. The development of heavy drinking and alcohol-related problems from ages 18 to 37 in a U.S. national sample. *Journal of Studies on Alcohol* 61, 290-300.

- Picken, A.L., Berry, K., Tarrier, N., Barrowclough, C., 2010. Traumatic events, posttraumatic stress disorder, attachment style, and working alliance in a sample of people with psychosis. *The Journal of nervous and mental disease* 198 (10), 775.
- Pilton, M., Bucci, S., McManus, J., Hayward, M., Emsley, R., Berry, K., in submission. Does insecure-attachment mediate the relationship between trauma and voice-hearing in psychosis?
- Purnell, C., 2010. Childhood trauma and adult attachment. *Healthcare Counselling and Psychotherapy Journal* 10 (2), 1-7.
- Raby, L., Cicchetti, K.D., Carlson, E.A., Egeland, B. & Collins, W.A. 2013. Genetic contributions to continuity and change in attachment security: a prospective, longitudinal investigation from infancy to young adulthood. *Journal of Child Psychology and Psychiatry* 54, no. 11, 1223-1230.
- Read, J., Os, J.v., Morrison, A., Ross, C.A., 2005. Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications. *Acta Psychiatrica Scandinavica* 112 (5), 330-350.
- Varese, F., Smeets, F., Drukker, M., Lieveise, R., Lataster, T., Viechtbauer, W., Read, J., van Os, J., Bentall, R.P., 2012. Childhood adversities increase the risk of psychosis: a meta-analysis of patient-control, prospective-and cross-sectional cohort studies. *Schizophrenia bulletin* 38 (4), 661-671.
- Varghese, D., Scott, J., McGrath, J., 2008. Correlates of delusion-like experiences in a non-psychotic community sample. *Australasian Psychiatry* 42 (6), 505-508.
- Vermunt, J.J., Parkinson, T.J., 2002. Claw lameness in dairy cattle: New Zealand-based research. . *New Zealand Veterinary Journal* 50, 88-89.